of brain-case 22 ; palate length 22·5, breadth between outer corners of p^4 16 ; greatest horizontal diameter of p^4 5·1, of m^2 3·4.

Hab. Hargaisa, Somaliland, alt. 1500 m.

Type collected by Dr. A. E. Atkinson, Oct. 26, 1896.

Native name "Shog Shog."

XLVI.—*The Nomenclature of some European Bats.*

By Gerrit S. Miller, Jr.

While working out the synonymy of the North-American Vespertilionidæ I have found that some glaring errors now pass current in the nomenclature of several European bats. These may be most conveniently discussed under three headings: (I.) the genera *Vespertilio* and *Myotis*, (II.) the genera *Pipistrellus* and *Pterygistes*, and (III.) the genus *Barbastella*.

I. *The Genera* Vespertilio *and* Myotis.

The generic name *Vespertilio* has long been applied to the 38-toothed members of the family Vespertilionidæ, but in accordance with one of the fundamental laws of nomenclature—that when a composite genus is subdivided its name can never be transferred to a group not included in the original assemblage—this use of the name is inadmissible. The genus *Vespertilio*, Linnæus ('Systema Naturæ,' i. ed. x. pp. 31–32, 1758), included seven species—*vampyrus*, *spectrum*, *perspicillatus*, *spasma*, *leporinus*, *auritus*, and *murinus*. Only two of these, *auritus* and *murinus*, are European. Since it is clear that a non-exotic species should in such a case be made the type of the genus, on the ground that in this way the original meaning of the author will be most closely retained, one of these two must be selected. The species *auritus* was removed to the genus *Plecotus* by Geoffroy in 1818 (Descr. de l'Égypte, Mammif. p. 112). Thus *murinus* is left as the type of the genus *Vespertilio*. True *Vespertilio murinus*, however, is a totally different animal from the one commonly known by that name. To understand the matter fully it is necessary to refer to the two editions of the 'Fauna Suecica,' where Linnæus describes the animal in more detail than in the 'Systema Naturæ.' In the first edition he mentions only one bat, the "Läderlapp," "Fladermus," or "Natt-blacka." This he calls "*Vespertilio caudatus, naso oreque simplici*" (No. 18, p. 7, 1746). In the second edition two

species are mentioned, No. 18 of the first edition (here numbered 2) and the long-eared bat, "*V. caudatus, naso oreque simplici, auriculis duplicatis, capite majoribus*" (pp. 1–2, 1761). These had already received binomial names, *Vespertilio murinus* and *V. auritus* respectively, in the tenth edition of the 'Systema Naturæ,' where the following diagnosis of *V. murinus* is given: "*V. caudatus, naso oreque simplici, auriculis capite minoribus*" (p. 32, 1758). In the second edition of the 'Fauna Suecica' the teeth of *V. murinus* are thus described*:—"Dentes primores superiores 6, acuti distantes; inferiores 4, acuti contigui. Laniarii superiores 2, anteriore majore; inferiores 3, antico maximo. Molares utrinque 3, tricuspidati."

It thus appears that the *Vespertilio murinus* of Linnæus, the type of the genus *Vespertilio*, is a common Scandinavian bat with ears shorter than the head, and with the dental formula $i\,\frac{2-2}{3-3}$†, $c\,\frac{1-1}{1-1}$, $pm\,\frac{1-1}{2-2}$, $m\,\frac{3-3}{3-3}=32$.

The only known Scandinavian bats which combine these characters are the members of the group commonly known as *Vesperus* in Europe and *Adelonycteris* in America, but to which Mr. Oldfield Thomas has recently applied the name *Eptesicus*, Rafinesque‡. Therefore the genus *Vespertilio* with its principal synonymy stands as follows:—

Vespertilio, Linnæus, 1758.

1758. *Vespertilio*, Linnæus, Systema Naturæ, i. ed. x. pp. 31–32. Type by elimination *Vespertilio murinus*, Linnæus (not *V. murinus*, Schreber, 1775).

1820. *Eptesicus*, Rafinesque, Annals of Nature, p. 2. Type *Eptesicus melanops*, Rafinesque,= *Vespertilio fuscus*, Beauvois.

1829. *Cnephæus*, Kaup, Skizzirte Entw.-Gesch. u. natürl. Syst. der europ. Thierw. 1ster Theil, p. 103. Type *Vespertilio serotinus*, Schreber.

1839. *Vesperugo*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 312 (part.).

1839. *Vesperus*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 313. Based on the 32-toothed species of "*Vesperugo*."

1841. *Noctula*, Bonaparte, Iconografia Fauna Italica, i. fasc. xxi. (under *Vespertilio aleythoe*). Type *Vespertilio serotinus*.

1856. *Cateorus*, Kolenati, Allgem. deutsch. naturhist. Zeitg. Dresden, neue Folge, ii. pp. 131, 162–163. Type "*Vesperugo*" *serotinus*.

1856. *Meteorus*, Kolenati, Allgem. deutsch. naturhist. Zeitg. Dresden,

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* In the first edition the dental formula is the same, except that the lower incisors are said to be five in number, an error corrected in the second edition.

† In Linnæus's statement the figures 4 and 6 are evidently transposed.

‡ Proc. Zool. Soc. Lond. 1896, pt. iv. p. 791, April 1, 1897.

neue Folge, ii. pp. 131, 167–169 (included *Nilssoni, discolor, Savii, leucippe*, and *aristippe*).

1878. *Vesperugo*, Dobson, Catal. Chiroptera Brit. Mus. p. 183 (part.).

1892. *Adelonycteris*, H. Allen, Proc. Acad. Nat. Sci. Philad. (1891) p. 466, January 19, 1892. Proposed as a substitute for *Vesperus*, preoccupied in entomology.

The exact identification of the species *murinus* among the Scandinavian members of the genus *Vespertilio*, although a matter of considerable difficulty, does not affect the use of the generic name. Nilsson *, after a careful review of the facts, decided that the animal must have been the bat to which Natterer afterward applied the name *discolor*. He therefore very properly placed the latter in the synonymy of *V. murinus*, Linnæus, and reinstated Bechstein's name *myotis* for the *Vespertilio murinus* of Schreber. Nilsson did not recognize "*Vesperugo*" as distinct from "*Vespertilio*." Hence he said nothing in regard to the tenability of the generic names. Ten years later, Blasius †, though admitting that the *Vespertilio murinus* of Linnæus could not be the bat commonly known by that name, considered the species undeterminable, and therefore reasoned that the name first applied to it might afterward be properly used by Schreber in a different sense. It is not surprising, then, that Blasius continued to apply the name *Vespertilio*, Linnæus, to the genus to which he had restricted it eighteen years before, notwithstanding the fact that, according to his own statement, it could not be made to include any of the Linnæan species. In these rulings Blasius was followed by Lilljeborg ‡, who gave detailed reasons for his belief that it is impossible to determine whether Linnæus's bat is the species afterwards called *Vespertilio discolor* by Natterer, or that called *Vespertilio Nilssoni* by Keyserling and Blasius. In his opinion, contrary to that of Nilsson, the odds are in favour of the latter. Lilljeborg calls attention to Blasius's mistake in applying the generic name *Vespertilio* to a group containing no species known to Linnæus, but concludes that since this error has become time honoured, it were better uncorrected.

Notwithstanding the inconvenience to which such a course leads, there can scarcely be any valid reason for rejecting the identification of Linnæus's *Vespertilio murinus* made by Nilsson. The doubt admittedly lies between two species, one of which he deliberately chose with all the facts before him. As nothing in the original description is in any way

* Skand. Fauna, Däggdjuren, pp. 17–20 (andra upplagen) (1847).

† Fauna der Wirbelthiere Deutschlands, Säugethiere, p. 74 (1857).

‡ Sveriges och Norges Ryggradsdjur, i. pp. 124–126, 144 (1874).

discrepant with this determination it should be adopted. The synonymy of the species is as follows :—

Vespertilio murinus, Linnæus.

1758. *Vespertilio murinus*, Linnæus, Systema Naturæ, i. ed. x. p. 32.
1819. *Vespertilio discolor*, Natterer, in Kuhl, Deutsch. Flederm. p. 43.
1839. *Vesperugo discolor*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 312.
1847. *Vespertilio murinus*, Nilsson, Skand. Fauna, Däggdjuren, p. 17 (andra upplagen).
1878. *Vesperugo discolor*, Dobson, Catal. Chiropt. Brit. Mus. p. 204.

The Serotine becomes

Vespertilio serotinus, Schreber.

The bat usually called *Vesperugo borealis* by recent writers must be known as

Vespertilio Nilssoni (Keyserling & Blasius).

1836. *Vespertilio Kuhlii*, Nilsson, Illum. Fig. Scandin. Fauna, Häft 17, pl. 34 (not *V. Kuhlii*, Natterer, in Kuhl, Deutsch. Flederm. p. 58, 1817).
1838. *Vespertilio borealis*, Nilsson, Illum. Fig. Scandin. Fauna, Häft 19, pl. 36 (not *Vespertilio borealis*, Müller, Natursyst. Suppl. p. 21, 1776).
1839. *Vesperugo Nilssoni*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 315.
1878. *Vesperugo borealis*, Dobson, Catal. Chiroptera Brit. Mus. p. 203.
1894. *Vesperugo Nilssoni*, Rhoads, Reprint of Ord's North-American Zoology, Appendix, p. 3.

The genus *Vespertilio* of Linnæus contained, as already shown, none of the 38-toothed bats to which the name is generally applied. For these bats therefore the name must be replaced by *Myotis*, Kaup, the first based on a member of this group. Hence the genus *Vespertilio* of authors becomes

Myotis, Kaup, 1829.

1829. *Myotis*, Kaup, Skizzirte Entw.-Gesch. u. natürl. Syst. der europ. Thierw. 1ster Theil, p. 106. Type *Vespertilio murinus*, Schreber (not *V. murinus*, Linnæus).
1829. *Nystactes*, Kaup, Skizzirte Entw.-Gesch. u. natürl. Syst. der europ. Thierw. 1ster Theil, p. 108. Type *Vespertilio Bechsteinii*, Leisler.
1839. *Vespertilio*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 306. (Not *Vespertilio*, Linnæus, 1758.)
1841. *Selysius*, Bonaparte, Iconografia Fauna Italica, i. Introduzione [p. 3]. Type *Vespertilio mystacinus*, Leisler.
1856. *Brachyotus*, Kolenati, Allgem. deutsch. naturhist. Zeitg. Dresden, neue Folge, ii. pp. 131, 174–177. Based on the species *mystacinus*, *Daubentonii*, and *dasycnemus*.

1856. *Isotus*, Kolenati, Allgem. deutsch. naturhist. Zeitg. Dresden, neue Folge, ii. pp. 131, 177–179. Included the species *Nattereri* and *emarginatus*.
1870. *Acorestes*, Fitzinger, Sitzungsber. math.-nat. Cl. k. Akad. Wissensch. Wien, lxii. Abth. i. pp. 427–436. Included the species *villosissimus*, *albescens*, *nigricans*, and *levis*.
1870. *Comastes*, Fitzinger, Sitzungsber. math.-nat. Cl. k. Akad. Wissensch. Wien, lxii. Abth. iv. p. 39. Included *Capuccinii*, *megapodius*, *dasycnemus*, and *limnophilus*.
1878. *Vespertilio*, Dobson, Catal. Chiroptera Brit. Mus. p. 284 (not *Vespertilio*, Linnæus, 1758).

The specific name *Vespertilio murinus*, Schreber, 1775, is preoccupied by *V. murinus*, Linnæus, 1758. As already pointed out by Nilsson, it must therefore give way to *Vespertilio myotis*, Bechstein, 1791. The common, large, 38-toothed bat of Central and Southern Europe is then

Myotis myotis (Bechstein).

1775. *Vespertilio murinus*, Schreber, Säugthiere, i. p. 165, pl. li. (not *Vespertilio murinus*, Linnæus, 1758).
1791. *Vespertilio myotis*, Bechstein, Naturgesch. Deutschl. i. p. 1154.
1839. *Vespertilio murinus*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 306 (not *V. murinus*, Linnæus, 1758).
1847. *Vespertilio myotis*, Nilsson, Skand. Fauna, Däggdjuren, p. 20 (andra upplagen).
1878. *Vespertilio murinus*, Dobson, Catal. Chiroptera Brit. Mus. p. 309 (not *V. murinus*, Linnæus, 1758).

II. *The Genera* Pipistrellus *and* Pterygistes.

It has already been shown that one of the several genera commonly associated as subgenera under the name *Vesperugo* must take the name *Vespertilio*. It remains to show that the name *Vesperugo* cannot be used in any sense.

As originally defined by Keyserling and Blasius, the genus *Vesperugo* included twelve species: *serotinus*, *discolor*, *Nilssoni*, *Savii*, *leucippe*, *aristippe*, *noctula*, *Leisleri*, *Kuhlii*, *allolimbatus*, *Nathusii*, and *pipistrellus*. These were arranged in two subgenera—*Vesperugo*, including the 34-toothed species, and *Vesperus*, those with 32 teeth. The subgenus *Vesperus* is exactly equivalent to the restricted genus *Vespertilio*, Linnæus, to the genus *Eptesicus*, Rafinesque, and to the genus *Cnephæus*, Kaup, each of which antedates it. Aside from this, however, it would be necessary to find the type of the genus among the species referred by the authors to the typical subgenus. These represent two modern groups—the first consisting of *noctula* and *Leisleri*, the second of the

remaining 34-toothed species. Each of these groups had been named by Kaup ten years previously. Therefore each of the constituent parts of the genus *Vesperugo* was provided with a tenable name at the time when the composite genus was formed. The first of the two genera into which the original subgenus *Vesperugo* is now divided is

PIPISTRELLUS, Kaup, 1829.

1829. *Pipistrellus*, Kaup, Skizzirte Entw.-Gesch. u. natürl. Syst. der europ. Thierw. 1ster Theil, p. 98. Type *Vespertilio pipistrellus*, Schreber.
1839. *Vesperugo*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 312 (part.).
1856. *Nannugo*, Kolenati, Allgem. deutsch. naturhist. Zeitg. Dresden, neue Folge, ii. pp. 131, 169–172. Based on *Nathusii*, *pipistrellus*, and *Kuhlii*.
1856. *Hypsugo*, Kolenati, Allgem. deutsch. naturhist. Zeitg. Dresden, neue Folge, ii. pp. 131, 167–169. Included "*Vesperugo*" *maurus*, Blasius, and "*V.*" *Kraschenínikovii*, Eversmann.
1878. *Vesperugo*, Dobson, Catal. Chiroptera Brit. Mus. p. 183 (part.).
1893. *Vesperugo*, H. Allen, Monogr. Bats N. Am. p. 121.

The type species, the Pipistrelle, is therefore

Pipistrellus pipistrellus (Schreber).

The second of the included genera is

PTERYGISTES, Kaup, 1829.

1829. *Pterygistes*, Kaup, Skizzirte Entw.-Gesch. u. natürl. Syst. der europ. Thierw. 1ster Theil, pp. 99, 100. Type *Vespertilio noctula*, Schreber.
1839. *Vesperugo*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 312 (part.).
1842. *Noctulinia*, Gray, Ann. & Mag. Nat. Hist. x. p. 258. Included *proterus* and *fulvus*.
1856. *Panugo*, Kolenati, Allgem. deutsch. naturhist. Zeitg. Dresden, neue Folge, ii. pp. 131, 172–174. Included *noctula* and *Leisleri*.
1878. *Vesperugo*, Dobson, Catal. Chiropt. Brit. Mus. p. 183 (part.).
1893. *Noctulinia*, H. Allen, Proc. U.S. National Museum, p. 30.

The type will stand as

Pterygistes noctula (Schreber).

III. *The Genus* Barbastella.

In Dobson's Catalogue of the Chiroptera in the British Museum the generic name *Barbastellus* is discarded in favour of *Synotus*, Keyserling and Blasius, 1839, on the ground that it was first applied to a species of *Nyctophilus* *.

* P. 175, footnote.

While the name was so used by Gray in 1831, it had been applied by him to the Barbastelle under the slightly different form *Barbastella* ten years previously. Therefore it must be retained for the genus represented by that species. The synonymy is as follows :—

BARBASTELLA, Gray, 1821.

1821. *Barbastella*, Gray, London Medical Repository, xv. p. 300. Type *Vespertilio barbastellus*, Schreber.
1839. *Synotus*, Keyserling & Blasius, Wiegmann's Archiv für Naturgeschichte, v. Bd. i. p. 305. Type *Vespertilio barbastellus*, Schreber.

The type species is therefore

Barbastella barbastellus (Schreber).

The specific name *barbastellus* is a masculine substantive, and does not change its termination when combined with a feminine generic name.

XLVII.—*A Revision of the Species of Butterflies belonging to the Genus* Teracolus, *Swains.* By ARTHUR G. BUTLER, Ph.D., F.L.S., F.Z.S., &c.

IT is now upwards of twenty years since I first essayed a Monograph of this most attractive group of Pieridine Rhopalocera, and horrified my old friend Hewitson by adding nearly fifty species to those already described. Since that date many beautiful new forms have been received from various parts of Africa and from Arabia.

Until quite recently the variation of the species of *Teracolus* has been but little studied, very few facts bearing upon the seasonal modifications of the different forms having been published. It is true that so far back as 1877 Mr. Mansel Weale (Trans. Ent. Soc. 1877, pp. 273–5) proved by experiment that *T. keiskamma* and *T. auxo* were produced from exactly similar larvæ and pupæ found upon a *Cadaba* bush in autumn and spring, and he suggested that they were variations influenced by the amount of moisture at the season of their emergence. This suggestion, however, was received with a good deal of scepticism.

In vol. viii. of the 'Journal of the Bombay Natural History Society' Capt. E. Y. Watson, of the Indian Staff Corps, published an article on the synonymy of some species of Indian Pieridæ, in which he reduced the Oriental *Teracoli* to